

INSTRUCTION MANUAL Ver 1.2

NETWORK VIDEO SERVER / BB01





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About This Document

If an administrator has previous knowledge of networking, please follow the Quick Start Guide.

If an administrator is new to networking and has no previous knowledge of the subject, please follow the step-by-step procedures for configuring, installing, and accessing your Network Video Server (NVS).

Please follow the entire walk-through without skipping any steps. The walk-through was designed to teach the typical inexperienced home user how to configure their NVS using the simplest techniques and terminology. Some of these techniques may actually be considered inaccurate, but should suit the needs of most home users. Consult the FAQ and Appendices for further information when required. There is a basic Internet and TCP/IP Tutorial at the end of this document

If after following the walk-through and exhausting all literature, please contact our Support Center for technical support.

Notes Before Starting

- This product is only compatible with current variants of the Microsoft Windows OS.
- This product operates with Microsoft's Internet Explorer only.
- You must have ActiveX controls enabled on your browser, found in the Options menu.
- Some pop-up blockers may block legitimate configuration screens, please disable these blockers when configuring the NVS.
- Some hardware manufacturers include a cable/DSL modem, router/firewall, and Ethernet switch in one device.
- If you have no available ports on your router (with integrated switch) you can purchase a 10/100 Ethernet switch to "expand" your Local Area Network
- The crossover cable is not wired as a typical straight-through network cable. This cable (or any crossover) should be used for initial setup of the NVS via a PC/laptop.
- Please temporarily disconnect any proxy servers associated with Internet Explorer while configuring the Network Video Server.

Modification and Development

The Linux-based operating system and flash memory file system enable advanced users and application developers to customize the Network Video Server. An SDK developer kit is available for users to interface ActiveX controls and other applications.

Attempts to modify the NVS will void all warranties and is not supported by Bluenet Video. Further development tools and documentation for assistance may be accessible in future releases. We strongly recommend that inexperienced users DO NOT modify the firmware of NVS.

Bluenet Video will not be held accountable in a user's attempt to modify the NVS that renders the unit inoperable or otherwise.

Installation

This may be installed as a standalone unit or as a supplement to an existing surveillance system.

Physical connection utilizing 10baseT Ethernet compatible UTP RJ-45 network cable. Installs directly using NTSC or PAL video cameras using BNC connectors.

Product Description

□ Front Panel



- **Power Supply Connector**

Use the power jack to connect your regulated 12V DC power adapter

- **Serial Communication Connector**

The 9-pin D-sub connector includes 2-channel serial communication.

COM1 is typically used for Pan/Tilt Camera and COM2 is for Digital In/Out

COM1 : RS-485/RS-232C (Option), COM2 : RS-232C

- **Network Connector**

The server is designed to operate on a 10/100 Mbps Ethernet network.

Currently the server operates at 10 Mbps until future upgrades become available

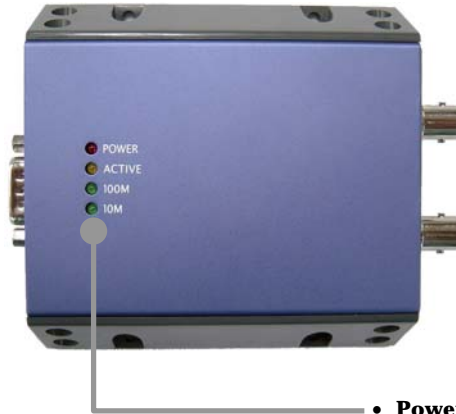
□ Rear Panel



- **Video In/Out Connector**

Each video input/output is terminated using a coax/BNC connector. Physical connections are made using RG-59 coaxial video cable; recommended maximum length of 300 feet. These provide the connections for virtually any type of security camera, CCTV devices, camcorder, VCR, DVR, etc. Adapters to connect to the BNC are available.

□ Top View



- **Power LED**

This red light becomes illuminated when 12V DC power is supplied to the unit. This indicator should always be lit when in use. If it is not lit or flashes when power is supplied, the Video Server is not operating properly.

- **Active LED**

When in use, this orange indicator should always be flashing or flickering. During reboots or power cycling, it may take several seconds for the unit to initialize and illuminate the indicator.

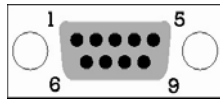
- **100M LED**

This indicator may flash during a reboot or power cycling, but should not be lit during normal operation. 100Mbps is indicated by this light and is currently unavailable.

- **10M LED**

This green indicator should be flashing or glowing during normal operation. During a reboot or power cycling, it may take up to 30 seconds to initialize, negotiate your network speed, and begin operation at 10Mbps. If this light is not lit after 30 seconds of operation, check then network cable to ensure a proper connection. When a proper connection is met, the green indicator should immediately glow

❑ Serial Connector



• COM1

> In case of RS-485

Pin	Signal	Remarks
2	D-	Input/Output
3	D+	Input/Output

> In case of RS-232C

Pin	Signal	Remarks
2	RXD	Input
3	TXD	Output
5	GND	Power

① Check the COM 1 communication type located on the underside label of the NVS.

• COM2 : RS-232C

Pin	Signal	Remarks
6	+12V	Power Output
7	RXD	Input
8	TXD	Output
9	GND	Power

① Sensor I/O module is optional.

❑ Crossover Cable



- The crossover cable is not wired as a typical straight-through network cable. This cable (or any crossover) should be used for initial setup of the NVS via a PC/laptop. After initial setup of NVS, use a straight-through cable for normal operation.

DDNS**Registration**

For users that have DYNAMIC addressing from their Internet Service Provider (ISP) you will need to register with our DDNS service.

We recommend you determine if you use dynamic addressing and if you do, register your Network Video Server on our DDNS website FIRST, before you configure, setup, or install the NVS.

You do not need to register with our DDNS if you were supplied a STATIC IP address from your ISP.

The only information that you will need off of the NVS for registration is the serial number located on the underside label of the NVS.



When you join our DDNS service, you will have to supply an ID and Password, the ID and Password do NOT have to match the ID and Password logon information used to access your NVS. It is a separate service with separate logon information.

After joining our DDNS service and configuring the NVS, you will be able to access your cameras in two ways:

- ① Go to www.mybluenetvideo.com and select your camera from the list or login
- ② You may also access it by simply entering a URL of "UserID. mybluenetvideo.com/CameraName" into your address bar. Replace "UserID" with the UserID you have chosen when registering with the DDNS service.

① If you have only one camera registered, you do not need to specify the camera name.

Quick Start

Please follow the steps below to complete the initial setup of the Network Video Server (NVS)

- ① Please do not power on the NVS until instructed.
 - ① Temporarily disable any proxy servers configured in Internet Explorer
 - ① If connecting the NVS directly to a modem, power down and reset the modem. Leave the modem powered down until configurations are finalized with the NVS and the NVS has been correctly connected to the modem.
-
- ① You will need to access a PC/laptop and configure that PC in order to communicate with the NVS. Record the current TCP/IP properties of that PC (IP address, subnet mask, gateway, DNS, etc)
 - ① If your PC obtains its IP address automatically, then no need to record any information.
 - ② Change the IP address of that host PC to 192.168.1.11 and subnet mask to 255.255.255.0 (leave all other entries blank)
 - ③ Connect the NVS to your PC's Ethernet port via the supplied crossover cable (it does not matter what end is used for the PC)
 - ④ Power on the NVS using the supplied power adapter.
 - ⑤ After 1 minute of power, verify a solid POWER indicator, a flashing ACTIVE indicator, and a flashing or solid 10M indicator. After the corresponding indicator lights are proper, open Internet Explorer.
 - ⑥ Type - <http://192.168.1.80> (default IP of the NVS) into your address bar.
 - ⑦ Default ID/Password are both the word: admin
 - ⑧ Familiarize yourself with the Viewer Interface Screen.
 - ⑨ Locate the TCP/IP configuration under Administration Tools. Supply the same ID and Password to enter Administration Tools (admin:admin)
 - ⑩ Under "Network Type" select STATIC. You will only select Dynamic or PPPoE if you are connecting the NVS directly to your cable/DSL/Broadband modem and your Internet Service Provider is supplying you a dynamic or PPPoE address.
 - ① If you have a network with other devices (such as PC/laptop, etc.) or a router, you will NEVER select Dynamic or PPPoE. (PPPoE function currently unavailable)



- ⑪ Configure the NVS's TCP/IP settings as you would any other PC on your network, providing a proper IP address, subnet mask, default gateway, and DNS server. Input a DDNS Server address of : www.mybluenetvideo.com

① If this is standalone unit with a direct connection to a cable/DSL/Broadband modem then input the addresses you have received from your ISP. If you received no IP address from your ISP, please select Dynamic or PPPoE and choose the proper settings.

- ⑫ The NVS utilizes two TCP ports - a Web Server Port for utilizing Internet Explorer and a Video Server Port to support the streaming video. If this NVS will be directly attached to a cable/DSL/Broadband modem or has been assigned a static IP from your ISP, then leave the default port settings. If you are installing the NVS on a network, you must define a Web Server Port other than 80. The Video Server Port can remain unchanged.
- ⑬ If the NVS is connected to a network that utilizes a router, you must have Port Forwarding configured on your personal router to forward both the Web Server Port and Video Server Port to the IP address you have assigned the NVS.
- ⑭ After configuring Port Forwarding on your router (if necessary), you may then access your NVS on your local network by opening Internet Explorer and specifying the IP address and Web Server Port that you have assigned to the NVS.

① Examples: <http://192.168.0.200:8888> or <http://24.106.88.123>

① If you left your Web Server Port set to 80, then you don't need to specify the port in the Address Bar when accessing the NVS

- ⑮ Access your NVS via the Internet :

- ☐ If you used a static IP address assigned by your ISP
 - i) Open Internet Explorer.
 - ii) Type the IP of the NVS.
 - iii) If you use a router, type the routers' static IP and the web port number of the NVS.
- ☐ If you have a dynamic address provided by your ISP
 - i) Open Internet Explorer and visit our DDNS website: www.mybluenetvideo.com
 - ii) Register with our service. (you will need the serial number of the NVS, located on the bottom of the unit)
 - iii) Reboot the NVS.
 - iv) Give the DDNS server 2 minutes to locate your NVS's IP information.
 - v) Click the refresh button in Internet Explorer.
 - vi) After your camera is connected, click on your camera.
 - vii) You may also access it by simply entering
"UserID. mybluenetvideo.com/CameraName" into your address bar.

NVS Initial Setup via a Crossover Cable

This section provides a guide on how to connect the NVS to your PC/laptop for initial setup.

Please follow the instructions in the order they appear, without skipping steps. Do not supply power to the Network Video Server, until instructed.

In order to access the Network Video Server's firmware you will need to connect the Video Server directly to a PC or laptop computer via the supplied crossover cable.

- ① Before you begin, you must determine the current network/INTERNET (TCP/IP) settings on the PC or laptop you plan to setup the Network Video Server. Please ensure that the computer you wish to use to setup the video server is on your current network and has Internet access. Jot down your entries below for quick reference.

① For information on how to determine your current settings, see Appendix A

Current TCP/IP Settings	
IP Address	
Subnet Mask	
Default Gateway	
1st DNS Server	
2nd DNS Server (Option)	

- ② In order for the Network Video Server to communicate with your PC, you have to change your PC's IP address and subnet mask

① We recommend that you change your IP address to 192.168.1.11 and change the subnet mask to 255.255.255.0

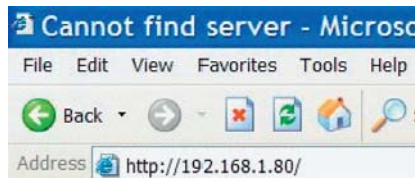
Leave all other entries (Default Gateway, DNS Servers, etc.) blank.

① For information on how to change your IP address and subnet mask, see Appendix B

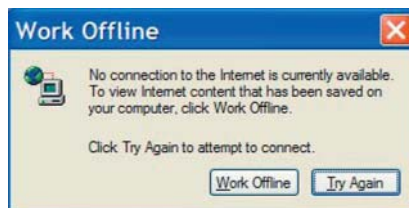
- ③ After you have made the changes to your IP address and subnet mask, you may then attach the Network Video Server to your PC via the supplied crossover cable. Plug in either end of the crossover cable into the PC's network card and the other end into your Network Video Server.
- ④ After connecting the PC and Network Video Server (NVS) using the crossover cable, power on the NVS by plugging in the power supply shipped with the NVS.
- ⑤ No longer than 1 minute after powering on the NVS, verify that the POWER indicator light is solid, the ACTIVE indicator light is flashing, and the 10M indicator light is flickering or solid. If they are not, please read the FAQ.

- ⑥ Now you will be able to access the viewer software within the NVS

- ① Open Internet Explorer and type the IP address of 192.168.1.80 (default IP of the NVS from the factory) into the Address Bar of the web browser (as seen below). Press Enter.



- ① If a message appears after pressing "Enter" similar to the image depicted below, choose "Try Again". This message will vary depending on the operating system.



- ⑦ Now you will be able to see the login screen for the Network Video Server.



- ⑧ The default ID and Password are both the word "admin" (without the "")
- ⑨ If at any time you are prompted to download ActiveX controls, you must click 'Yes', all content is safe.
- ① You will have to click "Yes" twice to two individual prompts. This allows your video to be displayed in Internet Explorer.

Guide to Network Setup

Please configure the NVS at the location of its installation. You must determine your network scenario in order to configure the NVS with the proper TCP/IP settings. This tutorial will guide you through the process. Before actually configuring the NVS, determine what settings you will apply. Record those settings that you will use to configure your NVS for reference.

When configuring your NVS, treat the NVS as another PC on your network. You will assign it several addresses and other TCP/IP properties to match your current network.

This step-by-step tutorial will teach what IP addresses and network configurations you should assign your NVS based upon your network scenario.

- ① Before you begin, you will need to locate any information and settings that you have received from your Internet Service Provider (ISP). You may need to refer to these IP addresses at a later time during the configuration.

- ① If you were not given any IP addresses or the ISP was responsible for the setup and installation of your Internet connection on your PC or network, then please go to step ②
- ① If you are not using a router on your network, your “Current TCP/IP Settings” (from the previous section) and “Assigned IP Addresses from My ISP” will be exactly the same

Assigned IP Address	
IP Address	
Subnet Mask	
Default Gateway	
1st DNS Server	
2nd DNS Server (Option)	

Static ☐

Dynamic ☐

PPPoE ☐

- ② You must determine whether the IP address that you were assigned from the ISP is STATIC, DYNAMIC, or using PPPoE. At this moment, you are only concerned about the ISP. Did they provide you with a STATIC, DYNAMIC, or PPPoE address? If you are unsure, please contact your ISP.
- ③ Configure your NVS’s TCP/IP settings for network connectivity by selecting Administration Tools from the main interface and selecting TCP/IP located on the left of the Administration Tools screen.
- ④ If prompted for an ID and Password, use “admin” for both entries.

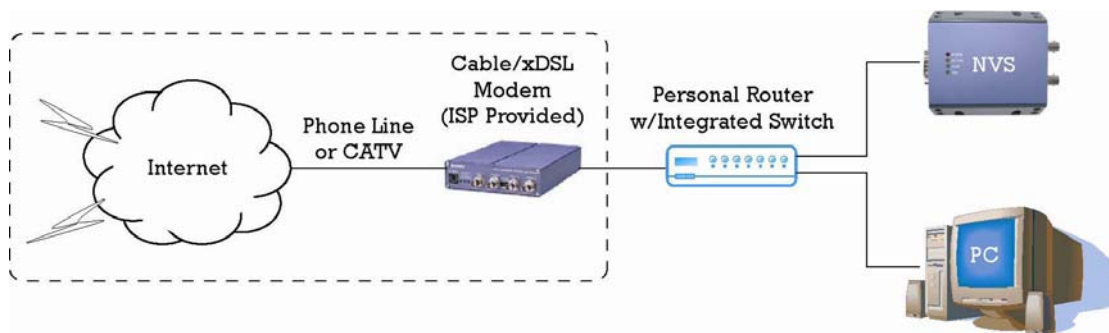
The default web port number is 80. If your ISP blocks port 80 you must use a value 1025-30000. Please consult your ISP and determine if they block TCP port 80.

- ⑤ Depicted below are several basic network scenarios. Determine which scenario describes your network. If your network does not match one of the below scenarios and are unsure how to setup your NVS, please contact your network administrator, then call our Support Center.

①

Dash line box signifies areas of your network that you can't control. Only the ISP has access to these devices.

Case A : Dynamic IP or PPPoE + Personal Router [Most SOHO]



Configure your NVS's TCP/IP properties as follows :

☐ Network Type • STATIC (even though you have Dynamic IP from your ISP, use STATIC on the NVS)

☐ Internet Address • A private IP address such as 192.168.0.200 [Example]

- ① You need to assign the NVS an IP address, just as you would assign a PC.
- ① The IP address you assign must be unique to your network as well as match your network. For information how to chose a unique IP and match your network please read the FAQ.
- ① The IP address you assign the NVS must be a private IP. For information on how to chose a private IP please read the FAQ

☐ Subnet Mask • 255.255.255.0 [Example]

- ① you must use the same subnet mask as the one you noted under "Current TCP/IP Settings"

☐ Default Gateway • 192.168.0.1 [Example]

- ① This IP address must be the IP address of your router (private or LAN side)
- ① Use the same Default Gateway you noted under “Current TCP/IP Settings”

☐ Primary DNS Server • Use the 1st DNS Server from “Assigned IP Address from My ISP”

- ① if you did not receive any IP addresses from your ISP, please contact them and acquire the IP address of their DNS server.

☐ DDNS Server • www.mybluenetvideo.com

- ① This is the same site you will register with later to accommodate dynamic IP from your ISP.

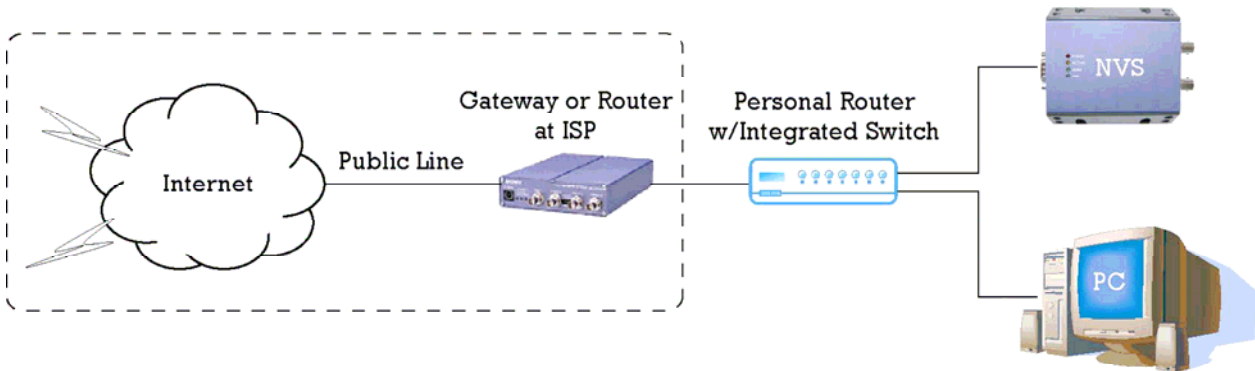
☐ Web Server Port • 8888

- ① Do NOT use the default port 80, you must change this number.
- ① You may select any number between 1025-30000.

☐ Video Server Port • 7777

- ① you may select any number between 1025-30000.

Case B : Static(Fixed) IP + Personal Router [Efficient]



- ① If you have 1 static IP address from your ISP follow the below instructions.
If you have 2 or more available static IP addresses from your ISP follow CASE C.

Configure your NVS's TCP/IP properties as follows :

☐ Network Type • STATIC

☐ Internet Address • A private IP address such as 192.168.0.200 [Example]

- ① You need to assign the NVS an IP address, just as you would assign a PC.
- ① The IP address you assign must be unique to your network as well as match your network. For information how to chose a unique IP and match your network please read the FAQ.
- ① The IP address you assign the NVS must be a private IP. For information on how to chose a private IP please read the FAQ

☐ Subnet Mask • 255.255.255.0 [Example]

- ① you must use the same subnet mask as the one you noted under "Current TCP/IP Settings"

☐ Default Gateway • 192.168.0.1 [Example]

- ① This IP address must be the IP address of your router (private or LAN side)
- ① Use the same Default Gateway you noted under "Current TCP/IP Settings"

☐ Primary DNS Server • Use the 1st DNS Server from "Assigned IP Address from My ISP"

- ① if you did not receive any IP addresses from your ISP, please contact them and acquire the IP address of their DNS server.

❑ DDNS Server

- www.mybluenetvideo.com

① This is the same site you will register with later to accommodate dynamic IP from your ISP.

❑ Web Server Port

- 8888

① Do NOT use the default port 80, you must change this number.

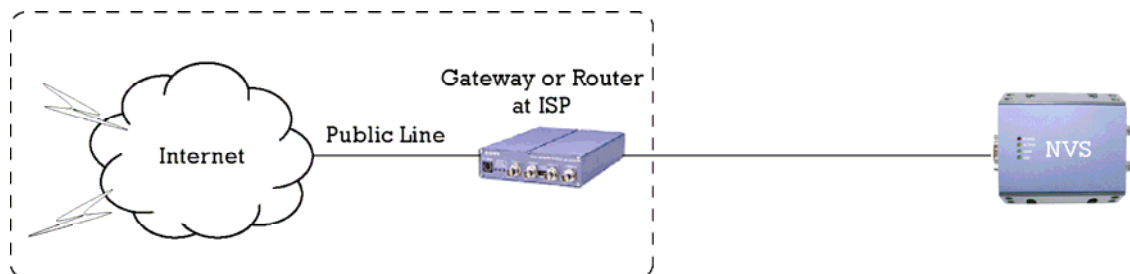
① You may select any number between 1025-30000.

❑ Video Server Port

- 7777

① you may select any number between 1025-30000.

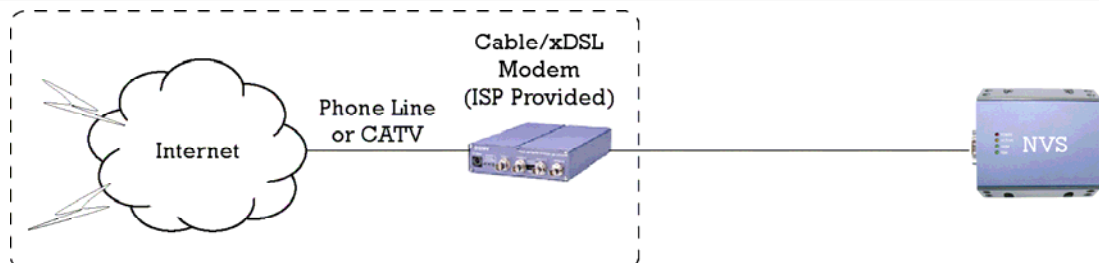
Case C : Static(Fixed) IP [Dedicated line directly to the NVS]



Configure your NVS's TCP/IP properties as follows :

- ❑ Network Type • STATIC
- ❑ Internet Address • A static IP address received from your ISP, such as 24.107.88.125 [Example]
 - ① You need to assign the NVS an IP address, just as you would assign a PC.
 - ① This must be a public IP address.
- ❑ Subnet Mask • Subnet mask assigned from your ISP, such as 255.255.255.240 [Example]
- ❑ Default Gateway • 24.107.88.113 [Example]
 - ① Use the assigned default gateway from your ISP
- ❑ Primary DNS Server • Use the 1st DNS Server from "Assigned IP Addresses from My ISP"
 - ① if you did not receive any IP addresses from your ISP, please contact them and acquire the IP address of their DNS server.
- ❑ DDNS Server • www.mybluenetvideo.com
 - ① This is the same site you will register with later to utilize our DDNS service.
- ❑ Web Server Port • 80 [default]
 - ① For most cases, keep this at default, but you may select any number between 1025-30000.
- ❑ Video Server Port • 7777
 - ① you may select any number between 1025-30000.

Case D : Dynamic IP + DSL/Cable Modem [Connected directly to the NVS]



Configure your NVS's TCP/IP properties as follows :

☐ Network Type • DYNAMIC

☐ DDNS Server • www.mybluenetvideo.com

① This is the same site you will register with later to accommodate dynamic IP from your ISP.

☐ Web Server Port • 80 [default]

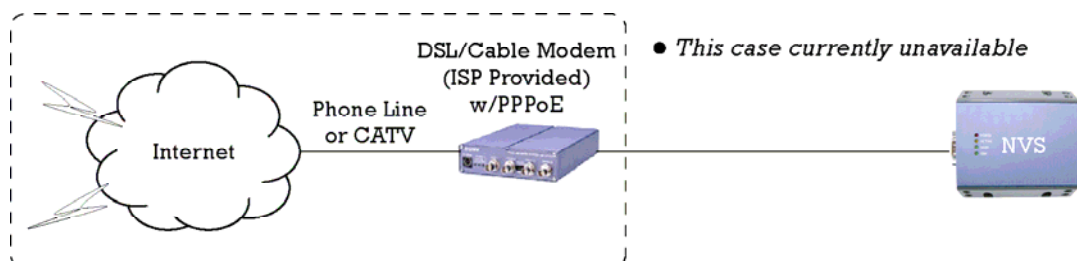
① You may select any number between 1025-30000.

☐ Video Server Port • 7777

① you may select any number between 1025-30000.

① When connecting the NVS directly to a modem, power down and reset the modem. Leave the modem powered down until configurations are finalized with the NVS and the NVS has been correctly connected to the modem. Then power on the modem, followed by the NVS.

Case E : PPPoE + DSL Modem [Connected directly to the NVS]



Configure your NVS's TCP/IP properties as follows :

- ☐ Network Type
 - PPPoE (PPPoE function currently unavailable)
- ☐ User ID
 - Use the User ID or Username you received from your ISP for this direct connection
- ☐ User Password
 - Use the Password you received from your ISP for this direct connection
- ☐ DDNS Server
 - www.mybluenetvideo.com
 - ① This is the same site you will register with later to utilize our DDNS service
- ☐ Web Server Port
 - 80 [default]
 - ① You may select any number between 1025-30000.
- ☐ Video Server Port
 - 7777
 - ① you may select any number between 1025-30000.

Port Forwarding

After entering the correct TCP/IP settings you will be ready for “Port Forwarding” (Cases A, B).

- ❑ Please record the TCP/IP settings of your NVS for future reference. You may need this information to access your NVS and to configure “Port Forwarding”. In Case F, please contact your ISP with regard to Port Forwarding.

NVS TCP/IP Settings	
IP Address	
Subnet Mask	
Default Gateway	
Primary DNS Server	
DDNS Server	
Web Server Port	
Video Server Port	

- ❑ **After clicking “Apply” the system will prompt for a reboot. Please allow the system 30 seconds to reboot and accept the changes. After 30 seconds, close the configuration screen. The view will display “Trying to Reconnect”. If the ACTIVE light on the NVS has went off and is now back on again flashing, then the NVS has rebooted. After the system reboots completely, remove the power supply from the unit and close Internet Explorer.**
- ❑ Return your PC/Laptop TCP/IP properties to their original settings.
- ❑ Before installing the NVS, you must use “Port Forwarding” on your personal router (Cases A, B). You will need to forward 2 ports:
 - Web Server Port you assigned to the NVS.
 - Video Server Port you assigned to the NVS.

Both of these ports will be forwarded to the IP address you assigned to the NVS.

In the Case A & B examples above, you would forward:

- 8888 → 192.168.0.200
- 7777 → 192.168.0.200

① For information on how to use “Port Forwarding” please read Appendix C

Starting NVS

After correctly forwarding the Web Server Port and the Video Server Port through your router (if applicable), you may then install the NVS in a proper location.

- ① Locate the serial number located on the label attached to the bottom of the NVS, you will need this for DDNS registration.



- ② Connect a device to the NVS (camera, DVR, Pan/Tilt/Zoom, etc.) and supply power to the device.
- ③ Connect the NVS to your router or cable/DSL modem (per your network scenario) via a Cat5/5e UTP Ethernet network cable.
- ④ Supply power to the NVS.
- ⑤ After 30 seconds, verify the NVS indicators:

• POWER	Solid
• ACTIVE	Flashing
• 100M	OFF
• 10M	Flickering/Solid
- ⑥ After configuring Port Forwarding on your router (if necessary), you may then access your NVS on your local network by opening Internet Explorer and specifying the IP address and Web Server Port that you have assigned to the NVS..

- ① Examples: <http://192.168.0.200:8888> or <http://24.106.88.123>
- ① If you left your Web Server Port set to 80, then you don't need to specify the port in the Address Bar when accessing the NVS.

⑦ Access your NVS via the Internet:

☐ If you use Case B

- i) Open Internet Explorer.
- ii) Type the static IP received from your ISP followed by the Web Port Number of the NVS. <http://24.106.88.123:8888> (example)

☐ If you use Case C

- i) Open Internet Explorer.
- ii) Type the IP of the NVS.

☐ If you use Case A, D, E

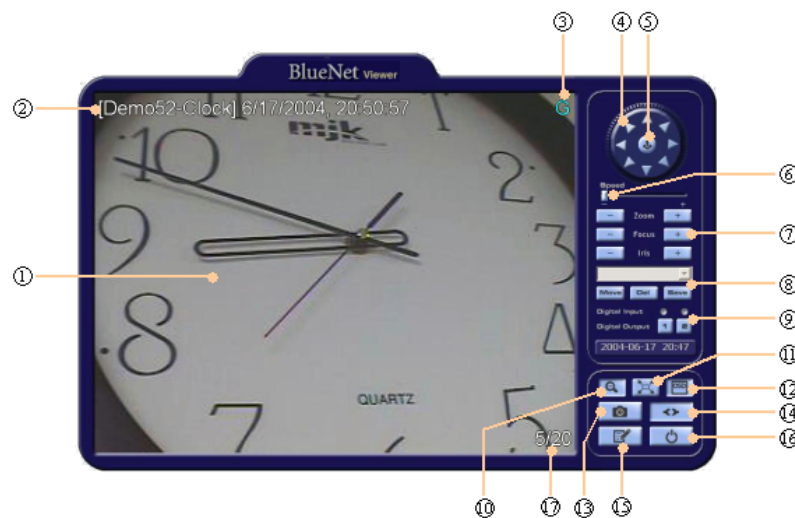
- i) Open Internet Explorer.
- ii) Visit our DDNS website: www.mybluenetvideo.com
- iii) Register with our service (you will need the serial number of the NVS, located on the bottom of the unit)
- iv) Give the DDNS server 10 minutes (MAX) to locate your NVS's IP information. You may reboot the server to send an immediate request to our DDNS server, rather than waiting the 10 minutes. The reboot command is available under the Admin Tools interface.
- v) After your camera is connected, click on your camera.
- vi) You may also access it by simply entering:

“UserID. mybluenetvideo.com/CameraName” into your address bar.

- ① Replace “UserID” with the UserID you have chosen when registering with the DDNS service.
- ① If you have only one camera registered, you do not need to specify the camera name.
- ① If you cannot access the NVS please consult the FAQ section.

Viewer Screen

This section is designed to familiarize you with the main interface of the NVS. Displaying the OSD and Digital Zoom are only taking place on the local machine, not on the video server itself. To make global changes on the video server and its video, you must login as an administrator.



- ① Camera Image Display
- ② OSD - Camera Name / Date / Time
- ③ OSD - This indicator displayed represents the function caption when a specific user logs on.
 - P = Operating User : Pan/Tilt control available
 - G = Guest User : Image monitoring only
- ④ Use these arrows to control a PTZ device.
- ⑤ If available, click this icon to enable PTZ controls. Only one user may have access to the PTZ controls.
- ⑥ Speed option for Speed Dome Camera or PTZ devices.
- ⑦ Zoom, Focus, and Iris functions for PTZ devices that support the listed functions.
- ⑧ Presets used by some PTZ devices that support preset directions and zoom.
- ⑨ Digital Inputs status and Digital Outputs control.
- ⑩ 2× Digital Zoom

- ⑪ Stretch will fit the video to the viewer window regardless of resolution. In essence this provides:
- 160×120 resolution : 4× digital zoom effect
 - 320×240 resolution : 2× digital zoom effect
 - 640×480 resolution : no change
- ⑫ OSD (On Screen Display) : Click this icon to display the captions.
- ⑬ Click this icon to save an image.
- ⑭ Click this icon to disconnect or connect from the server
- ⑮ Click this icon to enter Administration Tools
- ⑯ Click this icon to logout

This section is provided to familiarize the user with the administration tools. Intuitive options are not explained in detail.

All the options under Administration Tools take effect in real time the instant the new settings are applied. These settings will be global, affecting all users currently logged on.

All settings are global and take place immediately except for the 'Caption' settings, which require all users to logout or refresh their browser before noticing a change on the OSD.

Video Tool

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> Camera Name | Give a name to the device or camera connected to the NVS. Only affects what is displayed on the OSD. (Maximum 7 characters available) |
| <input type="checkbox"/> Caption | Determine what items are displayed on the OSD. Changes will take effect only after the user logs out. |
| <input type="checkbox"/> Color | Select this option to change the color picture to a black/white picture. Changing to "Gray" may increase FPS rates slightly when viewing remotely |
| <input type="checkbox"/> Resolution | Select the resolution (or screen size) of the video stream. Obtain maximum FPS at the 320x240 resolution. Higher the resolution, lower the FPS remotely. |
| <input type="checkbox"/> Frame Rate | Select the frame rate of video stream to control the traffic of network. |
| <input type="checkbox"/> CCD Assembly | Select how a CCD or camera is mounted |
| <input type="checkbox"/> Camera Mount | Select how the camera is mounted. This option will inverse the picture to accommodate ceiling-mounted cameras |
| <input type="checkbox"/> Quality | Adjusts the quality setting. Higher the quality, lower the FPS remotely. |
| <input type="checkbox"/> Brightness | Input a value to adjust the brightness of the video stream. |
| <input type="checkbox"/> Contrast | Input a value to adjust the contrast of the video stream. |

Control Tool

The screenshot shows the 'Control' window with two main sections:

- Serial Port Protocol:**
 - Com1: BluenetVideo [WiseCop Pro] (PTZ Control)
 - Com2: None (Auxiliary Device)
- Serial Port Setup:**
 - Com1 Type: ☒ RS-232 ☐ RS-485
 - Com1 Wait Time: 50 (1~1000)ms

Buttons for 'Apply' and 'Cancel' are at the bottom.

☐ Com1

For PTZ devices only. Select the PTZ control protocol.

A dropdown menu showing the following options: BluenetVideo [WiseCop Pro], None, BluenetVideo [WiseCop Pro] (highlighted), WonWoo, PelcoD, and C&B Technology [Zoom Camera].

☐ Com2

For Digital I/O module only. Select the module type.

A dropdown menu showing the following options: None, None (highlighted), and BluenetVideo [Digital I/O Module].

☐ Com1 Type

Select the type of COM1 port.

☐ Com1 Wait Time

Wait time for the response after data is sent to PTZ device.

It is important value when COM1 is RS-485 type and bi-directional(full-duplex) protocol is used. In this case, If this time is too short you can lose the data from device.

Recommended value is 50 msec in case of RS-485, 200 msec in case of RS-232C.

TCP/IP Tool

TCP/IP

Network Type

☒ Static
☐ Dynamic
☐ PPPoE

IP Setup

IP Address :
 Subnet Mask :
 Default Gateway :
 Preferred DNS Server :
 WEB Server Port : [Default : 80. Available Range : 1025 ~ 30000]
 Video Server Port : [Default : 7777. Available Range : 1025 ~ 30000]

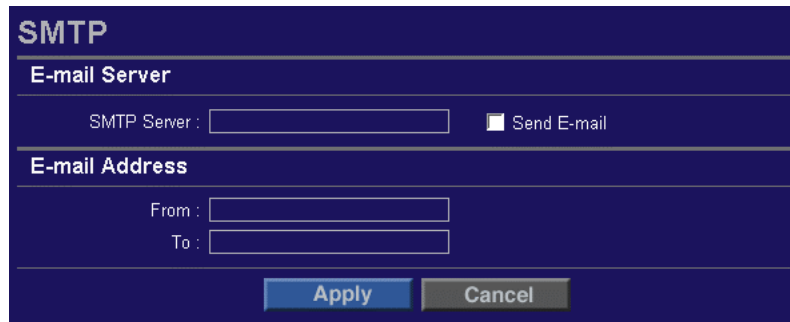
DDNS Setup

DDNS Address :

- ☐ **Network Type** Select a Static or Dynamic address scheme that is used by the Internet Service Provider (not the addressing scheme used by a personal router).
- ☐ **Internet Address** Input a value to assign an IP address to the NVS.
- ☐ **Subnet Mask** Input a value to assign a subnet mask to the NVS.
- ☐ **Default Gateway** Input the IP address of the default gateway.
- ☐ **Primary DNS Server** Input the IP address of an ISP's DNS server.
- ☐ **Web Server Port** Input a TCP port number to assign a Web Interface port number to the NVS.
- ☐ **Video Server Port** Input a TCP port number to assign a Video Server port number to the NVS.
- ☐ **DDNS Server** Input Bluenet Video's DDNS server address of www.mybluenetvideo.com

SMTP Tool

This function is used to email the specified email recipient and notify that individual of the IP address / web port number used to access the NVS. This email function is only activates on power-on reset time of NVS.



- | | |
|--|--|
| <input type="checkbox"/> SMTP Server | Enter an SMTP server to send email. |
| <input type="checkbox"/> Send E-mail box | If this check box is set to on, email function is enabled. |
| <input type="checkbox"/> From | Input the email address of sender. The email address should be admitted to the SMPT sever. |
| <input type="checkbox"/> To | Input the email address of receiver. |

Date & Time Tool

Date & Time

Current Camera Date & Time

Date : 2004-03-26 Time : 16:52:34

New Camera Date & Time

☒ Synchronize with my computer time

Date : 2004-03-26 Time : 16:42:02

☐ Set up Manually

Date : [] [yyyy-mm-dd]

Time : [] [hh:mm:ss]

☐ Synchronize with the time server

Time Zone : Korea Standard Time [KST+9:00]

Time Server : time.netcam4u.net

Apply Cancel

- ☐ **Current Date/Time** It shows the current Date/Time setting of NVS.
- ☐ **New Date/Time** Select the method of Date/Time setting. Date/Time can be set by local computer or timeserver or manual. To prevent the time and date from resetting when the server is powered down, we recommend choosing the option to sync with a time server.

Users Tool

Users

System Manager

ID	Password	Verify	Auto Login
admin	*****	*****	<input type="checkbox"/>

General Users

No.	ID	Authority	Auto Login
1	guest	Viewer	

☐ **System Manager** Specify an ID and Password for the System Administrator of the NVS. The System Administrator will have all rights and privileges to manage the system.

☐ **General Manager** Give access privileges up to 40 separate user accounts.

① Only 20 users may be logged on simultaneously, regardless of what user identities are logged on.

☐ **To add a user** Input an ID and Password, verify Password, select Authority, click ADD.

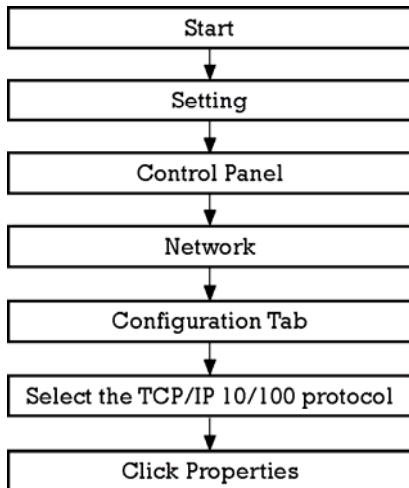
☐ **To edit a user** Select the user from the list of users, make necessary changes, and click EDIT.

☐ **To delete a user** Select the user from the list of users, click DELETE.

☐ **Operator Authority** This privilege gives the user rights to operate the PTZ controls. Only one user may have the authority to control the PTZ simultaneously.

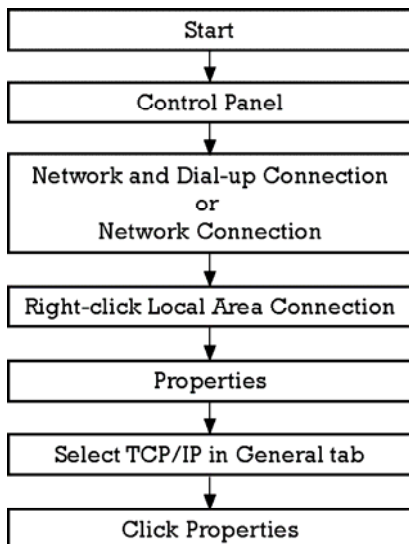
☐ **Viewer Authority** This privilege gives the user rights to operate only the icons associated with digital 2× zoom, stretch, OSD, and video capture. These options only affect that current user. The changes made there will have no effect on the other users logged on.

☐ **Auto Login** Only one user/administrator may have Auto Login enabled. When the video server is accessed, it will bypass the login screen and logon automatically.

A : Determining Current TCP/IP settings**❑ For Windows 98 / ME Users**

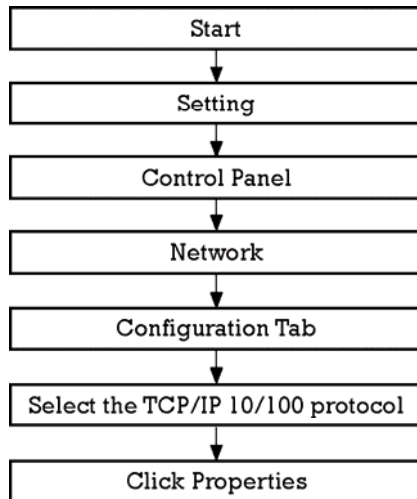
- Note the settings under the IP Address, DNS Configuration, and Gateway tabs. If you do not see any information listed, your settings have been obtained automatically.

① If your IP settings are obtained automatically, you could use the MS-DOS prompt (or Command Prompt) to determine your IP address. For information on how to do this, please read the FAQ.

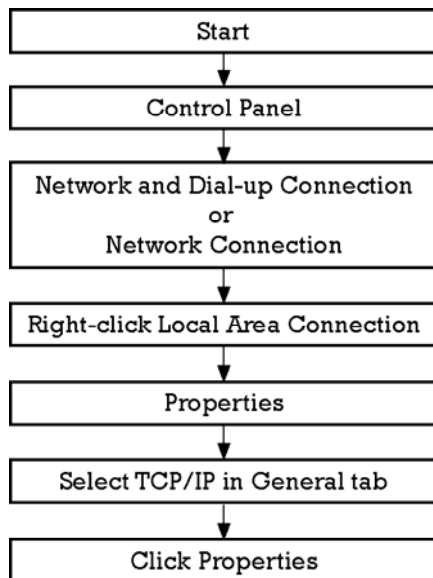
❑ For Windows 2000 or Windows XP

- Under the “General” tab of the TCP/IP Properties you will see your IP address information. If you do not see any information listed, your settings have been obtained automatically.

① If your IP settings are obtained automatically, you could use the MS-DOS prompt (or Command Prompt) to determine your IP address. For information on how to do this, please read the FAQ.

B : Changing your computer's IP address and subnet mask☐ For Windows 98 / ME Users

- Select 'Use the following IP address' and change the IP address and Subnet Mask.

☐ For Windows 2000 or Windows XP

- Select 'Use the following IP address'

C : Port Forwarding

After assigning the NVS a web server port and video server port you must use Port Forwarding (for cases A and B)

Please consult your router's user guide on how to correctly configure Port Forwarding.

For your convenience, we have provided two example configurations.

❑ For D-Link DI-604 broadband routers:

- ① Open a web browser and type <http://192.168.0.1> into your Address bar. (the default IP address to access the router)
- ② You will have to supply your User Name and Password to log onto the router. Default from factory. (User Name: admin Password: [leave blank])
- ③ Select the advance tab. This should be the Virtual Servers page.
- ④ Click the "Enabled" option button.
- ⑤ Give a description to the "Virtual Server"
- ⑥ Set the Private IP address to the IP address you have assigned the NVS.
- ⑦ Select TCP as the Protocol Type.
- ⑧ Set both the Private Port and Public Port the same value that you set the Web Server Port on the NVS.
- ⑨ Set the schedule for when you will allow access to the NVS.
- ⑩ Click Apply.
- ⑪ Repeat steps ⑤~⑩ for the Video Server Port that was configured on the NVS.
- ⑫ After the settings on the router have saved, you can exit the browser. Port Forwarding is complete.

❑ For Linksys BEFSR41 Cable/DSL routers:

- ① Open a web browser and type <http://192.168.1.1> into your Address bar (the default IP address to access the router)
- ② You will have to supply your User Name and Password to log onto the router. Default from factory (User Name:[leave blank] Password: admin)
- ③ Select Applications & Gaming from the menu bar.
- ④ Enter a description for your NVS Web Port in the Application entry.

- ⑤ Enter the Web Port number you have assigned the NVS into the Start and End fields.
- ⑥ Select TCP as the Protocol.
- ⑦ Enter the IP address of the NVS.
- ⑧ Check the “Enabled” checkbox.
- ⑨ Repeat steps ④~⑧ for the Video Server Port that you have assigned the NVS.
- ⑩ Click “Save Settings”
- ⑪ After the settings have been saved exit the browser. Port Forwarding is complete.

❑ I can't connect!!

In the case of a connection failure.

Modem Reboot > Modem Reboot Finished > Router Reboot > Router Reboot Finished > NVS Reboot > NVS Reboot Finish > Verify DDNS and NVS communication via www.mybluenetvideo.com, if applicable.

❑ How do I choose a unique IP address that matches my network?

For your home or small office, ensure that all devices on your network are running. PING an IP address that you plan to assign to the NVS. If you receive a "Request timed out", then you may use that IP address. To ensure the IP address that you will assign the NVS matches your network, review your "Current TCP/IP Settings" that you had recorded earlier. See some examples below:

- If your "IP Address" entry in "Current TCP/IP Settings" was 192.168.0.y, and your "Subnet Mask" was 255.255.255.0 then use 192.168.0.x for your NVS's IP Address ("x" meaning any number between 2-254 that you wish, as long as it passes the "PING" test).
- If your "IP Address" entry is not a 192.168.z.y address with a "Subnet Mask" of 255.255.255.0 then please contact our Support Center.
- If your "IP Address" entry is not a 192.168.z.y address, please contact our Support Center.

❑ How do I open an MS-DOS or Command Prompt?

- Windows 98 / ME Users : Start → Programs → Accessories → MS-DOS prompt
- Windows 2000 / XP Users : Start → (All) Programs → Accessories → Command Prompt

❑ How do I "PING" an IP address?

- ① Open an MS-DOS (or Command) prompt
- ② At the prompt type - "ping xxx.xxx.xxx.xxx" (without the quotes and replace the "x"s with an IP address)
- ③ Press Enter

❑ How do I enable or check ActiveX on my browser

Open Internet Explorer → Tools on the menu bar → Internet Options → Security Tab → Custom Level → Scroll down and verify that you are prompted or have enabled ActiveX controls and plug-ins to be downloaded and executed. → click OK → restart browser

❑ **How do I find out my IP address information if my settings were automatically detected?**

- Windows 98 / ME Users
 - ① Open an MS-DOS Prompt
 - ② At the prompt type: "winipcfg" (without the quotes)
 - ③ Use the drop down list to select your 10/100 Ethernet Adapter (not a PPP adapter)
 - ④ Now you will see your IP Address, Subnet Mask, and Default Gateway information
 - ⑤ For DNS information contact your Internet Service Provider
- Windows 2000 / XP Users
 - ① Open a Command Prompt
 - ② At the prompt type - "ipconfig /all" (without the quotes)
 - ③ Near the end of the information supplied, should be your current IP address, subnet mask, default gateway and DNS servers

❑ **How do I choose a private IP address:**

Assign your NVS a private IP address that matches your current network. Below lists the ranges for private addresses:

- Private Class A address space : 10.0.0.0 - 10.255.255.255
- Private Class B address space : 172.16.0.0 - 172.31.255.255
- Private Class C address space : 192.168.0.0 - 192.168.255.255

❑ **My POWER light is not on?**

Power is not being supplied to the unit. Please use the power supply shipped with the unit and verify that a power source is active from the attached power outlet used to connect the adapter. You can test this by plugging in any other electrical device and verify its operation. After using the power supply shipped with the product, checking the power source, and reinserting the power connector into the NVS, please call our Support Center. The power supply may be defective.

❑ **My ACTIVE light is not flashing?**

Verify the power supply to the unit. Power off the unit and back on again, wait 1 minute, if the ACTIVE light still does not begin to flash, you will have to set the unit to its factory default (THIS WILL DELETE ANY CONFIGURATION AND SET THE UNIT TO THE FACTORY DEFAULTS). Power on the unit and insert the end of a paper clip into the small recessed opening on the back of the unit. Use the clip to press the button located within that opening.

❑ My 10M light is not flashing or solid?

Verify the cable connection. 99% of the time the cable's connection to the unit is causing this problem. Try using a different network cable or crossover cable (for PC connection only). Try reinserting the cable, if this still doesn't solve the problem call our Support Center.

❑ I want to prevent users from viewing my camera.

- ① Go into Administration Tools of the NVS.
- ② Click on Users
- ③ Delete the user or all users by deleting the ID and password associated with that user.

❑ Can I record the video?

Yes you can record, but you will need to purchase a separate software program to allow PC-based recording. This software is available, please contact our Customer Service Center. The software named "I-PRO" will connect up to 16 separate 1-channel video servers for remote viewing, remote controlling, and remote recording without the loss of quality or size (up to 640×480 resolution).

❑ I can access the video server on my LAN, but not from the Internet.

Verify that your router (if applicable) has port forwarding properly configured. If accessing from our DDNS service, verify correct serial number. Firewall issues may prevent user access.

❑ How do I reset the unit to factory defaults?

On the underside of the unit you will find a recessed opening located near the top-left side of the label. Power ON the unit and use a paper clip to push the reset button within that opening. You should then see the ACTIVE light turn off and after a few seconds the ACTIVE light will begin to flash, signifying a successful reboot. If the ACTIVE light does not turn off after depressing the reset button, please try holding the button in for a second and releasing. **YOU WILL LOSE ALL DATA THAT HAD BEEN ENTERED PREVIOUSLY AND THE NVS WILL BE SET TO ITS FACTORY RESETS.**

❑ Does the Network video server support audio?

Not with this current release.

❑ **Can I use the Network Video Server on my dial-up Internet connection?**

It is possible, but we recommend a high-speed broadband connection of at least 128Kb/sec.

❑ **I'm accessing my video server remotely over the Internet and the video stream is choppy, is this normal?**

Yes. The frames/second received remotely are determined by your bandwidth capabilities both at your site where the NVS is installed and your remote location. The lower of the two sites will determine how fast your video stream is received. It is recommended to have at least a 256Kb/sec upstream connection from the site where the NVS is installed. Lower speeds will operate properly, but provide poor remote performance. Faster the Internet connection at both ends, the faster the video stream.

❑ **Can I view multiple cameras at once?**

Currently the NVS supports 1 channel of video input. Typically, one camera per network video server.

You can view multiple cameras only if the NVS is connected to another device supporting multiple cameras (DVR, multiplexer, etc.) or if you purchase the I-PRO software, which will connect up to 16 separate NVS, each connected to their own camera or device.

BB01 Specification

Model		BB01
Hardware	CPU	32Bit RISC Processor
	OS	Embedded Linux
	Flash Memory	4MB
Viewer		Web Browser based Monitoring
Network	Protocol	TCP/IP, HTTP, SMTP, PPP, UDP
	Interface	10 base-T Ethernet (RJ-45)
Compression	Algorithm	M-JPEG
	Rate	1/10 ~ 1/200
Video	Input	1CH. NTSC/PAL
	Output	1CH. NTSC/PAL
	Size	640 × 480, 320 × 240, 160 × 120
	Frame Rate	30 frame/sec (320 × 240)
Pan/Tilt Control	Communication	RS-485 / RS-232C (Option)
	Protocol	Pelco-D etc.
Sensor I/O (option)	Communication	RS-232
	I/O	2 Inputs / 2 Outputs
Power		DC12V / 500mA
Operating Temperature		0°C ~ 40°C
Dimension		98(W) × 27(H) × 100(L) mm including bracket
Weight		Approx. 150g

* Specification & design are subject to change without notice

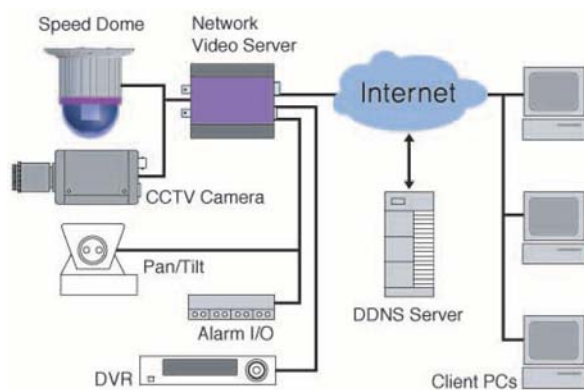
• Web Browser Viewer



• I-PRO Multi-Viewer



Typical Connections



Network

A computer network basically is a group of devices linked together usually using a communications protocol or language called TCP/IP. Normally these devices consist of PCs (personal computers), servers, and other devices. Most likely if you have multiple computers at a site, the chances are they are linked together forming a computer network.

A local network is a private network of computing devices. No one outside that local network can access without special conditions. So in this tutorial, when referenced to the local network, just assume the local network is the location where the NVS is installed.

A remote network is a group of computing devices located outside your local network. By special means it is possible for your local network to communicate with remote networks. For example, the Internet provider is just a remote network.

Internet

The Internet is basically a network of networks. There are physical links connecting the networks within the Internet. Information traveling the Internet usually travels along cables constructed of fiber optic cables, coaxial cables, telephone lines, and also a variety of wireless methods. This explains why many Internet service providers (ISP) are based from cable TV and telephone companies. They already have the physical media in place to transmit data on the Internet.

Below are two popular types of high-speed Internet.

1. *DSL* (Digital Subscribers Link) – This type of service travels along telephone lines. It is a dedicated line directly from the service provider (usually a telephone company) to your residence or place of business. So a DSL connection will run through your current phone lines (ADSL). ADSL provides higher download rates (retrieving data), but slower upload rates (sending data). The highest upload rate you can achieve with ADSL is typically 640 Kbps. SDSL provides the same speed on both download and upload, so it's nice to have when serving data with the high upload rate, but typically you have to have a dedicated line just for the service and it can't

be shared with your current telephone lines.

2. *Cable Access* – This type of service travels along the same cable as your CATV (Cable TV). That is why the provider of cable high-speed Internet is usually a cable TV company, since they can use the existing cable ran to the residence or place of business. It is a shared medium between you and your neighbors and is not a dedicated line. This in turn means, during peak hours of the day you may receive slower rates than accessing the unit late at night.

Static vs. Dynamic

The IP address that your Internet service provider supplies generally comes in one of two forms: static IP addressing or dynamic IP addressing. A static address does not change. They will assign you an IP address and that IP address is yours to keep until you cancel your service. Whichever device you assign this static IP, you can ensure that it will not change. Dynamic addresses on the other hand, may change. A special server located at the ISP automatically assigns these addresses. With dynamic addressing, the ISP will not give you any IP addresses, rather they will tell you to configure your equipment to obtain the IP automatically. This is done using DHCP. Unfortunately, with dynamic addressing the ISP is not guaranteeing that the IP address that was automatically obtained will stay the same, it may change. Many times the IP address that you are assigned will not change for a very long time, yet in some situations it may change on a continuous basis.

High-speed Internet

The term ‘high-speed’ does not really describe your connection too well, other than it’s not dial-up. Often it is asked, “How fast is you high-speed connection?”. This is very important concerning TCP/IP and your NVS. The speed of your connection is determined by the amount of ‘bandwidth’ available. When you register for a high-speed Internet service they should tell you the amount of bandwidth you will be granted. Bandwidth is basically how large or small the ‘pipe’ is that carries your data across the Internet. For an analogy, you can imagine that high-speed bandwidth is the size of residential plumbing for a house’s water supply, while dial-up bandwidth is the size of a straw. Therefore if you were pushing a large amount of water (or computer data for this analogy) through a house, you would have faster transfer through the use

of the plumbing rather than through a straw. The same concept applies with the Internet. For a large amount of data to travel the Internet then there has to be a large pipe to accommodate that data. When receiving high-speed Internet, the provider should give a bandwidth quote telling you how much bandwidth they will provide you. There are two types of bandwidth that you need to be aware of and many times the quote on your bandwidth will be displayed like this 1000/128. The first number is downstream bandwidth, the second number is upstream bandwidth.

Downstream Bandwidth – This determines the size of the pipe coming into your location. If you are retrieving data from other networks, you should have a large amount of downstream bandwidth. This also is stated in kilobits/sec (Kbps). Take in mind that Kbps is not equivalent to KB/sec.

Upstream Bandwidth – This determines the size of the pipe going away from your location. If you are providing or sending data to other networks, you need a large amount of upstream bandwidth. This value is given in kilobits/sec (Kbps). Keep in mind that Kbps is not equivalent to KBps

You may ask, “So do I have two separate lines, one for upstream and one for downstream for my Internet connection?”. The answer is ‘No’. You still have one physical line, but within that one line just imagine two separate pipes – one for downstream data transmission and one for upstream transmission.

The location where you install the NVS must be able to provide data to other remote locations quickly, thus you need as much UPSTREAM bandwidth as possible. You will be serving a large amount of data.

When accessing the NVS from a remote location (such as a hotel or home), you want as much DOWNSTREAM bandwidth as possible. You will be receiving a large amount of data.

You need high-speed Internet access when utilizing the remote viewing features of the NVS. Converting real-life images into compressed digital images requires a large amount of data. You simply can’t serve that large amount of data through a dial-up connection, the upstream pipe is way too small. For another analogy, it would be similar to pushing a tidal wave through a straw. Not only do you need high-speed Internet, but remember to request the highest amount of UPSTREAM bandwidth when deciding on a provider for the Internet access, to the location where the DVMR will be installed. Plus, the location from where you are accessing the data using the remote software should be at a location with high-speed Internet with a large amount of downstream bandwidth. You

can still access the DVMR using a dial-up connection, but you might receive a single image every several seconds. It is highly recommended to access the NVS through a high-speed connection as well.

You may ask, “So exactly what numbers would be good rates? What can I compare it to?” Below is a chart describing various bandwidth rates (speeds) that you can compare and determine which would suit your needs for live video data transfer.

UPLOAD RATES in Kbps

56	128	256	384	512	768	1000	2000+
Dial-up Very Poor	ISDN Poor	DSL/Cable Bearable	DSL/Cable OK	DSL/Cable Good	Cable Fast	Cable Speeding	Cable Awesome

DOWNLOAD RATES in Kbps

56	128	256	384	512	768	1000	2000+
Dial-up Websites	ISDN Websites	DSL/Cable Music	DSL/Cable Video	DSL/Cable Streaming Video	DSL/Cable Fast	DSL/Cable Speeding	Cable Awesome

Generally, the higher the values you receive the larger amount the fee, especially if you request a very large upstream bandwidth rate. Today, most high-speed Internet providers supply sufficient downstream rates, but often lack sufficient upstream rates to accommodate serving data. In your case, you are concerned about serving large amounts of data from your NVS site. So, you have to search for the best provider supplying sufficient upstream rates at a reasonable cost.

Now that you have a better understanding on the importance of how fast your high-speed connection is, you can appropriately request the type of service needed or upgrade your current account if desired.

Network Equipment

Now that you have an idea of high-speed Internet access, you have to determine what type of equipment you have on the site, so you will better understand how to connect your NVS to your current network.

Router: A router basically divides networks. Typically a router divides the network from the ISP's (Internet Service Provider) network and your local network. You must have a router to separate these networks. You must have a router to share an Internet connection. If you have a single PC on site that accesses the Internet and you want to enable another device to transmit over the Internet (ex. NVS) you must have a router to share the Internet connection. If you already have multiple PC's or devices accessing the Internet, then odds are you already have a router installed. A router essentially needs just two ports. One port links the remote network to the router and another port from the router to your local network. For most home users, small office/home office routers have a built-in switch to provide for multiple devices to connect to the router and share that main link to the remote network. Let us assume that the remote network we are referring to is the ISP's network. On your router you should be able to identify several ports. There always should be one port labeled 'WAN' or 'Internet'. That WAN or Internet port is used to connect your ISP's network to your router. The other ports are the 'switched' ports, which allow you to connect multiple Ethernet devices to the router to share the Internet connection. The image below shows a typical home office router.



You notice that there is the one WAN port with 8 other Ethernet ports available for use. All routers have at least 2 IP addresses, always. One IP address is to connect to your ISP and is assigned to your WAN or Internet port and the other IP address is logically connected to all of the other 'switched' ports. For instance the WAN (public) IP from your provider could be 54.63.2.123 and the other IP for your LAN (private) may look like 192.168.x.x.

PORT FORWARDING

Port forwarding is a feature in many routers that allows a device serving data within a local network to be accessed from outside the network (i.e. Internet). By default routers block requests from the outside if they haven't been initiated from within the local network. The router basis these requests on the application's TCP and/or UDP port number. The NVS uses 2 TCP ports. Consider the scenario in which a NVS is attached to a router. Without port forwarding configured on a router, a program outside the local network requests a connection to port 8888 (web port on our NVS), but is denied access as a security measure by the router. So therefore, if you are connecting an NVS to a router and that NVS is using a Private IP address, you **MUST** configure port forwarding on that router to tell the router to forward the ports to your NVS rather than block it. More information on port forwarding configuration is stated in the FAQ section.

Switch: A switch basically connects multiple devices together that are located on the same local network. These typically have many more ports than a router, generally anywhere from 5 switched ports to 48 switched ports. You can simply just connect a switch to a router to extend the amount of ports, thus devices allowed on the network or to share an Internet connection. Unless you have more than four devices on your local network, then you should be able to use the available 'switched' ports on your router to share an Internet connection. In many enterprise networks, a patch panel or closet is used to house several switches that connect all the networked devices on that location. For this tutorial's sake, switches will not be used. We will implement a single home office router. Switches are not used to connect networks, this is why you cannot use a switch alone to share an Internet connection.

Modem: A modem converts the electrical signals from your Internet provider to a signaling type that your computer or router can understand. Without a modem, the computer or TCP/IP device would not be able to understand the signaling method used by cable TV and telephone service providers. A modem will typically have one RJ-45 Ethernet port and one other port to accommodate either a cable TV coaxial cable or a DSL telephone line from your Internet service provider. Overall you will have the line from your ISP entering the modem and from the modem to your router's WAN port via a network cable. So that way the signal has been converted by the modem and also leads to your router, which separates your local network from the ISP's network.

Ethernet and RJ-45:

Ethernet is a popular communications protocol (language) used for multiple devices to 'talk' to each

other on a local network. RJ-45 is a type of connector similar to a standard telephone jack that is used in Ethernet cabling. A standard Cat5 network cable has RJ-45 connectors attached that allow direct connections to routers, switches, and PCs. You can distinguish between a telephone line connector and RJ-45 connector by its size. RJ-45 is slightly larger than a telephone line connector (RJ-11), and RJ-45 houses eight wires as opposed to four.

Note: Some devices contain a router, switch, and modem within the same unit.

MEMO

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